The Ultimate Modular Testing Toolkit for Multiple Technologies

With new diverse networks and the multiple technologies required to deliver services, an application specific test solution may not be enough – that's where the MTT family offers the best value in power, flexibility and future-proofing. The advantages start with the compact, hand-held MTT chassis. Two chassis are available: the MTT Color, and the MTT ACM II, which adds cable maintenance features. Both have a bright color screen and an intuitive graphical interface which make it easy to ensure that when you turn up the service, it works right the first time. And, both accept a wide range of test application modules which are field-swappable with no tools needed – just plug-and-play.

Supported Technologies:

Ethernet and Fibre Channel: BERT and QoS

Transport Infrastructure: E1/T1, E3/T3, datacom, SDH/SONET, ISDN BRI/PRI, GSM, GR303, SS7, V5.1/V5.2 and Frame Relay

Access infrastructure: Copper, ADSLx, VDSLx and SHDSL

Access services: VoIP, IP Video and VoD

Optical: OTDR, C/DWDM channel monitoring, Power Meter and end to end loss

Power Transmission: IEEE C37.94™

Ethernet, Triple Play and Storage

New GigE Module

The GigE Module is a powerful service installation and maintenance tool for 10/100/1000 Base-T, 100Base-Fx and 1000Base-SX. With wirespeed traffic generation, this module provides physical layer to IP layer testing including BERT and RFC2544. Its dual ports can verify that networks are operating within the defined Service Level Agreement (SLA) by monitoring live customer traffic.

Fibre Channel Module

The Fibre Channel Module is a versatile and cost-effective tool for Storage Area Networks (SAN), Fibre Channel and ESCON testing. In addition to the wirespeed traffic generation, it also provides port login feature for FC-2 testing. This module supports 1, 2 and 4 Gbps rates.

Transport Infrastructure

2.5 Gbps SDH/SONET Module

The SDH/SONET Module addresses the needs for the installation of SDH/SONET as well as PDH/T-carrier links. This module supports applications from 1.5/2 Mbps up to 2.5 Gbps (STM-16/OC-48) and ATM.

DS3 Module

The DS3 Module offers comprehensive T3 and T1 testing for installation and maintenance applications on high-speed DS3 links.

Dual T1 Module

From cable installation and maintenance to protocol monitoring and service verification, the Dual T1 Module offers a full suite of tools for testing T1 circuits.

E1 Module

With extensive E1 transmission and signaling testing capabilities, this module is an ideal installation, maintenance and service verification tool for the 2M access network.

Datacom/DDS Module

The Datacom/DDS Module offers extensive Datacom/DDS testing capabilities for the installation and verification of WAN/data links up to 2 Mbps.

IEEE C37.94™ Module

The IEEE C37.94 Module assists technicians in turning up a new circuit or in isolating problems on both sides (teleprotection and multiplexer) of the IEEE C37.94 network.

Access infrastructure and Services

New UDSL-3Play Module

The UDSL-3Play Module addresses key test requirements for Triple Play service deployed over a "universal" DSL access network. Features include VDSLx and ADSLx infrastructure tests and services testing for Data, Video and VoIP, enabling network service providers to verify and ensure these new IP based services are properly delivered to end users.

TI ADSL2+ ATU-R Module

The ATU-R Module enables field technicians to perform efficient service installation and verification for a variety of ADSL technologies, including the ITU ADSL2 (G.992.3) and ADSL2+ (G.992.5) standards.

VDSL VTU-R Module

The VDSL VTU-R Module simplifies VDSL2 installation by offering a one-button verification test. This VDSL2 modem emulation module is compliant with ITU-T G.993.1 and with ITU-T G.993.2 profiles 8d/12a.

SHDSL Module

The SHDSL Module provides SHDSL 2 and 4-wire modem emulation. STU-C and STU-R functions are supported for installation and prequalification. Advanced diagnostics at the ATM and IP layers are available as well as SHDSL/E1 modes.

VF TIMS Modules

The VF TIMS Module provides complete Voice Frequency testing in the analog voice range of 50 Hz to 20 kHz, supporting loop start, DID and ground start signaling.

Fiber Optics

Optical Loss Test Module

The Optical Loss Test Module combines the tests needed to qualify optical fiber networks and identify faults. This unit integrates a dynamic power meter, a light source, a visual fault locator, a fully automated bidirectional Optical Loss Test Set (OLTS), and Optical Return Loss (ORL) meter.

Optical Channel Monitor Modules

With the explosion of metro service installations, the CWDM and DWDM Modules provide a low cost alternative to optical spectrum analyzers. It provides key measurements including lambda, power, OSNR, and advanced features such as power and lambda drift detection.

Micro OTDR Modules

The Micro OTDR Module allows service providers a portable and affordable solution for verifying fiber networks during the construction phase, or troubleshooting problems during the maintenance phase. The evolution of the Access Network towards FTTx and Metro has created a need to equip each technician with an OTDR unit.

World of Support Resources

Service Centers

Sunrise Telecom's service centers provide high-quality repair services, with fast turnaround times and a strong focus on customer satisfaction.

Technical Support

Available by phone or e-mail, Sunrise Telecom technical support specialists are experts on our products, related technology, and applications. Field and sales support personnel can also provide local technical assistance.

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Fax hotline: 1-408-360-1958

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order@sunrisetelecom.com

Customer Support

1-800-701-5208 (US/Canada only)
1-408-360-2200 (International)

E-mail:

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www.sunrisetelecom.com

SUNRISE TELECOM®
We Make Networks Work

MTT Family Brochure

The Ultimate Modular Network Testing ToolKit

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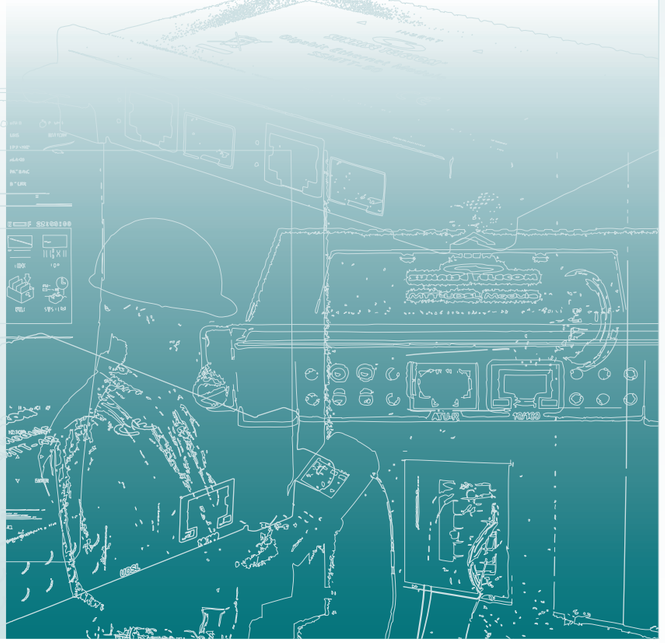

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C_0152_MTT_Family _Brochure

MKS-22000-001 REV: E00

SUNRISE TELECOM®
We Make Networks Work

Chassis

MTT ACM II

MTT ACM II Advanced Cable Maintenance Toolkit provides a comprehensive handheld test set for qualifying the copper pair for different DSL services including VDSL2, ADSL2+ and SHDSL. The ACM II's frequency range extends to 30 MHz – necessary for the more stringent copper loop verification required for VDSL2. In addition, the flexible configuration of this host chassis can support a variety of MTT service modules to meet the needs of every technician.

MTT Color

Ideal chassis for those who need service verification testing without the cable maintenance features. It is equipped with the same color screen as the MTT ACM II and supports the whole range of service testing modules.

SUNRISE TELECOM®

SunSet MTT®

ACM II Chassis

Data Sheet

The SunSet MTT ACM II Chassis features a family of plug-in modules, providing a wide variety of testing capabilities for the Access Network

The Advanced Cable Maintenance (ACM II) Chassis, part of the SunSet Modular Test Toolkit (MTT) family of test sets, is a rugged, battery-operated test solution for installation and maintenance of physical layer access network services. The new SunSet MTT ACM II is the industry's premier handheld test system designed to qualify copper cables at VDSL2 frequencies, readying service providers for triple play deployments.

The ACM II covers an industry best frequency range from voiceband to 30 MHz – necessary for VDSL2 qualification based on FTTN or MDU architectures. Our patented 'detaptor' feature helps identify short bridge taps, which are especially harmful for VDSL2 transmission. In addition, ACM II offers key voice frequency features that are common to industry methods and procedures. Using the SunSet MTT ACM II enables service providers to complete installations in less time and with greater confidence in the quality of service delivered to customers.

KEY FEATURES

- Color display
- Easy-to-use interface
- Fast and easy one-button auto test
- Dual trace TDR for in-depth fault location
- RFL to locate resistance faults
- Spectrum analyzer - 30 MHz PSD background noise
- 30 MHz insertion loss
- Voice frequency features
  - Longitudinal balance
  - Circuit noise and power influence
  - Power harmonics analysis
- Detaptor (patented) to determine lengths of bridge taps
- Supports many SSMTT/SSxDSL test modules

BENEFITS

- Handheld and portable
- Flexible and dynamic
- Copper qualification with extended VDSL2 frequency range
- Standard POTS installation tests
- Convenient and cost-effective
- Integrated cable maintenance features
- Enhanced troubleshooting and repair
- Complete FTTn/x testing in one package

Advanced Cable Maintenance Features

TDR

Display Options
- Single Trace
- Dual Trace (Split Screen, Overlap, Difference, Recall)

Distance Range: Dependent on cable type and condition

English	
Cable Gauge	**Distance Range**
22 AWG	15 ft. to 24000 ft.
24 AWG	15 ft. to 18000 ft.
26 AWG	15 ft. to 12000 ft.

Metric	
Cable Gauge	**Distance Range**
0.6 mm	3 m to 7200 m
0.5 mm	3 m to 5400 m
0.4 mm	3 m to 3600 m

Display Resolution: 0.6% of selected range
Pulse Widths: 12 nS to 4 µS, autoselect
Output Impedance: 100Ω
Vp: 0.4 to 0.99 in 0.01 increments
Automatic search to first fault

RFL

Fault Range: 10 MΩ
RTS: 4 kΩ
Accuracy of RTF (at 1 MΩ)
- ± 0.1% RTS ± 0.1Ω 0Ω to 100Ω
- ± 0.2% RTS ± 0.1Ω > 100Ω to 1000Ω
- ± 0.25% RTS ± 0.1Ω > 1000Ω to 4000Ω

DC Voltage

Range: 300V Max
Accuracy: ± 0.5% ± 10 mV

AC Voltage

Detector: True RMS
Range: 250 VAC Max
Accuracy: ± 1% ± 20 mV for 20 Hz to 1 kHz

Resistance

Range: 1Ω to 100 MΩ
Accuracy
- ± 1% ± 1Ω for 1Ω to 1 MΩ
- ± 2% for > 1 MΩ to 4 MΩ
- ± 5% for > 4 MΩ to 100 MΩ

Capacitance

Range: 1 nF to 2 µF
Accuracy
- ± 2% ± 300 pF for 1 nF to 1 µF
- ± 5% for > 1 µF to 2 µF

Current

Load: 430Ω
Range: 0 mA to 110 mA
Accuracy: ± 2% ± 0.1 mA

Insertion Loss

Range: 0 to 80 dB
Accuracy: ± 2 dB
Frequency response sweep from 13 kHz to 30 MHz
Detaptor: Bridge Tap Detection (Patented)

WB Background Power Spectral Density (PSD) Noise

Frequency Range: 13 kHz to 30 MHz
Resolution Bandwidths: 4.3125 kHz, 34.5 kHz
Level Range: -30 to -140 dBm/Hz

VF Background Power Spectral Density (PSD) Noise

Frequency Range: Up to 6000 Hz
Level Range: 10 dBrn to 90 dBrn

Power Harmonics

Frequency Range: Up to 6000 Hz
Level Range: -50 dBm to 40 dBm

VF Metallic Noise

Range: 0 dBrn to 90 dBrn
Resolution: 1 dBrn
Accuracy
- ± 1.5 dB from 10 dBrn to 90 dBrn
- ± 2 dB from 0 dBrn to 10 dBrn

Filter: C-Message
Impedance: 600Ω

Power Influence (Noise-to-Ground)

Range: 40 dBrn to 130 dBrn
Resolution: 1 dBrn
Accuracy: ± 1.5 dB
Filter: C-Message

Longitudinal Balance

Frequency: 1 kHz
Range: 0 to 70 dB
Accuracy: ± 2 dB

Impulse Noise

Threshold Range: 50 dBrn to 100 dBrn
Dead Time Range: 100 µS to 255 mS
Max Count Range: 1 to 9999
Timer: Settable from 1 to 999 minutes or continuous

Signal-to-noise

Frequency range: 13 kHz to 30 MHz

Near End and Far End Crosstalk (NEXT/FEXT)

Frequency range: 34.5 kHz to 30 MHz

Auto Test

User selectable tests with CSV output
Reports PASS/FAIL/MARGINAL status where applicable

Load Coil Detector

Graphic and count

Cable Pair Detect

Audible connectivity verification

Transmitter

Frequency Range: 10 kHz to 30 MHz
Frequency Resolution: 0.1 kHz
Frequency Accuracy: ± 25 ppm
Levels: 0 to -40 dBm in 1 dB steps
Level Accuracy: ± 1 dB
Output Impedance: 100Ω balanced

Receiver

Measurement Method: FFT
Frequency Range: 13 kHz to 30 MHz
Frequency Resolution: 4.3125 kHz
Level Range
+5 to -80 dBm for 13 kHz to 18 kHz
+10 to -80 dBm for > 18 kHz to 30 MHz
Level Resolution: 0.1 dB
Level Accuracy: ± 1 dB
Input Impedance: 100Ω balanced

PRODUCT DESCRIPTION

Size (W × L × H): 4.1 × 10.6 × 2.6 in (10.5 × 27 × 6.5 cm)
Weight: 3.5 lb (1.6 kg)
Display: Backlit 240 x 320 dot STN indoor/outdoor Color screen; CFL Backlight
Connectors: Five 2 mm banana test leads
LEDs: 20 bi-color
Serial Port: 8-DIN, RS-232C (V.24) DTE
DC Power Jack
Battery: Rechargeable, field replaceable NiMH pack
Charger: Universal 100-240 VAC adapter with IEC connector
Operating Temperature: 23˚ to 113˚F (-5˚ to 45˚C)
Storage Temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-ACM2
SunSet MTT ACM II
Includes a high resolution color display, mini-banana interface, and the following standard features: Dual and single trace TDR, DMM, Load Coil Detector, Metallic Noise, Power Influence, Longitudinal Balance, Cable Pair Detect, and Impulse Noise. Also includes standard 2.2 MHz measurement range for the following features: Insertion Loss, PSD Background Noise, Signal to Noise, and Frequency Generator. Standard Accessories include test cables, SunSet Jacket, and Certificate of Calibration.

SWMTT-ACM2-VDSL
Extended VDSL Range Features for SunSet MTT ACM II
Includes extended VDSL measurement range for the following features: Insertion Loss, PSD Background Noise, Signal to Noise, and Frequency Generator. Also adds NEXT and FEXT features.

SWMTT-ACM2-RFL
RFL Features for SunSet MTT ACM II
Includes Resistance Fault Locate features for the SunSet MTT ACM II

Replacement Accessories

SA274	Cable, 2 mm Test Leads (Black/Red) with bed-of-nails alligator clips, 6'
SA275	Cable, 2 mm Test Lead (Green) with bed-of-nails alligator clips, 6'
SA276	Cable, 2 mm Test Leads (Yellow/Blue) with bed-of-nails alligator clips, 6'
SA277	Cable, 2 mm Test Leads Kit (set of five cables)
SA278	Cable, RFL Strap
SA601	Jacket, SunSet MTT Family

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SUNRISE TELECOM®

Datacom/DDS Module

SSxDSL-9

Data Sheet

The Datacom/ DDS Module is part of a family of plug-in modules for the SunSet MTT® and xDSL test sets

The SSxDSL-9 Datacom/DDS Module, part of the SunSet Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution for WAN/data, Frame Relay, and DDS service verification. The module is designed to assist technicians in bringing up new data communication service and troubleshooting the existing data network fast and effectively. The powerful test module can be used for all your testing requirements including, DTE/DCE emulation for end-to-end testing of data networks, bidirectional monitoring for a greater level of troubleshooting for data networks, FOX testing for Frame Relay CIR verification, and Frame Relay Ping testing for checking link connectivity.

FEATURES

Datacom

- DTE/DCE emulation
- Bidirectional monitoring with Y-adapter
- V.35, RS232, RS449, RS530, X.21
- Data rates from 2400 bps to 2.048 Mbps
- Bit error rate testing with stress patterns
- Control lead status monitor for CTS, RTS, DSR, DTR
- Received data display
- Frame relay UNI/NNI testing

DDS 4-Wire

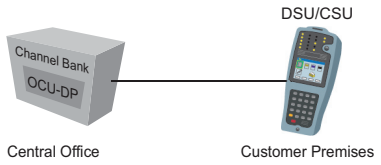
- CSU/DSU emulation
- Bit error rate testing on a primary channel
- Loopback testing
- Received data display

BENEFITS

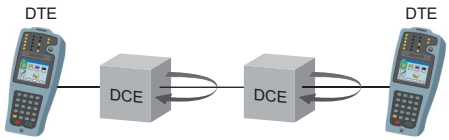
- Lightweight
- Flexible modular design
- Eliminates the need for multiple instruments
- Intuitive and easy-to-use
- Cost-effective and future-proof

APPLICATIONS

CSU/DSU CPE Mode

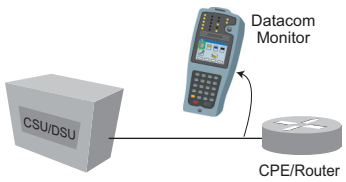


DTE Emulation



DCE Emulation

Datacom Monitoring



DATACOM SPECIFICATIONS

Supports V.35, X.21/V.11, RS232/V.24, RS449/V.36, RS530 interfaces
Test modes: DTE Emulation, DCE Emulation, Bidirectional monitoring
Connector: SCSI port with adapter cables

Operation Modes

DTE Emulation
- Point-to-point or point-to-loopback BERT
- Control and analyze datacom control leads

DCE Emulation
- Point-to-point BERT
- Control and analyze datacom control leads

Datacom Monitoring
- Bidirectional monitoring with Y-adapter cable
- Monitor control leads, frequency

Measurements

Bit error/G.821
  Error count and rate
  ITU-T G.821 Analysis
Data loss, data loss seconds, pattern loss, pattern loss seconds
Datacom interface analysis
View received data
Propagation delay

Frame Relay Basic (SWxDSL-9FRA)

LMI standards: ITU-T Q.933, ANSI T1.617, LMI (DLCI 1023, GOF Vendors), NO LMI
Modes: UNI DTE, UNI DCE

LMI Analysis
Results: Link OK Total, Link Errored Total, Timeout Error, Response Sequence Number, Wrong Message
PVC status

PING Test
Results: Number of PINGs, Number of PINGs sent, PING status (Received, Unreached, Errored), Round Trip Time (Current, Average, Maximum, Minimum)
InARP support
IP encapsulation conforms to RFC1490 specification
Echo PING

FOX Test
Results: PVC Status, Current Rate, Errored Frames, RSN Error, SSN Error, Frame Check Sequence (FCS) Error, Count of Frame Received with FECN, with BECN, with DE, Count of transmit frames, Count of received frames

Statistics Analysis
Bidirectional monitoring
Frame relay performance and statistics
DLCI analysis and statistics

Frame Relay NNI (SWxDSL-9FRNNI)

LMI standards: ITU-T Q.933, ANSI T1.617, LMI (DLCI 1023, GOF Vendors), NO LMI
Modes: NNI USER, NNI NETWORK

LMI Analysis, PING Test, FOX Test, Statistic Analysis *- as described in Frame Relay Basic section*

DDS 4-WIRE SPECIFICATIONS

Test modes: CSU/DSU Emulation
Signal: Bipolar return to zero with alternate mark inversion
Primary channel conforms to AT&T PUB 62310
Connector: 8-pin modular RJ-48

Operation Mode

CSU/DSU CPE Mode
- BERT testing at the DDS-4W interface
- Test primary channels
- Respond to DSU/CSU loop codes

Measurements

Frequency, LOSS, LOFS, EXZS, OOS, OOFS, BPVs, FBEs
Bit error/G.821 Analysis
View received data

Loopback Testing

Transmit: Latching DSU/CSU
Internal loopback: Manual or auto-respond to DSU/CSU command

Status/Alarm Indicators

Dual-color LEDs indicator
Current status and alarm history conditions

PRODUCT DESCRIPTION

Module size (WxLxH): 5.0 x 3.5 x 0.9 in (12.6 x 9 x 2.2 cm)
Operating temperature: 32˚ to 122˚F (0˚ to 50˚C)
Storage temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSxDSL-9	Datacom/DDS Module Testing at both Datacom and DDS-4W interfaces
SWxDSL-9FRA	Frame Relay Basic
SWxDSL-9FRNNI	Frame Relay NNI *[Requires SWxDSL-9FRA]*

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SUNRISE TELECOM

E1 Module

SSMTT-27/SSMTT-27L

Data Sheet

The E1 Module is part of a family of plug-In modules for the SunSet MTT® and xDSL test sets

The SSMTT-27 E1 Module, part of the SunSet Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution designed to assist field technicians with new link installation, routine maintenance, and troubleshooting problems in the E1 network. The E1 interface defined by ITU has been widely deployed and has become a dominant part of the digital telecommunication network in various applications including Cellular, Access, Switching, and Data networks. The E1 module comes with two versions, Dual E1 and Single E1 to fit your testing requirements. Both out-of-service and in-service testing can be performed with this module.

FEATURES

- Dual E1 BER testing (Dual E1 module)
- 75Ω unbalanced or 120Ω balanced connectors
- ITU-T G.821, G.826, M.2100 measurement
- Pulse mask analysis
- Histogram analysis
- Propagation delay
- View received data/FAS/MFAS words
- Error injection/alarm generation
- Level and frequency measurements
- Send frame word including Sa bit
- VF analysis: Send/measure test tones, noise filters, digit capture & analysis, and CAS analysis
- Jitter measurement, jitter transfer and tolerance testing
- Wander measurement
- GSM
- GPRS
- Frame relay
- ISDN PRI
- V5.1/5.2
- MFC-R2
- DTMF
- Signaling System No. 5 (SS5)

BENEFITS

- Lightweight
- Flexible modular design
- Eliminates the need for multiple instruments
- Complete solution for Installation & Maintenance (I&M) of E1 services
- Leverages existing MTT platform
- Cost-effective and future-proof
- Supports various applications on E1 with over 20 software options that can be easily upgraded in the field
- Enables service providers and operators to turn-up and troubleshoot E1 network

APPLICATIONS

Frame Relay

- LMI analysis
- Fox test (CIR verification)
- Ping test
- Statistic analysis
- Support UNI and NNI interfaces

GSM/GPRS

- Bidirectional channel monitoring at Abis and A interface
- Voice decode of full rate, enhanced full rate, half rate speech
- GSM protocol analysis at Abis interface
- TRAU testing (speech generation)
- GPRS statistic analysis at Abis and Gb interfaces

ISDN Primary Rate

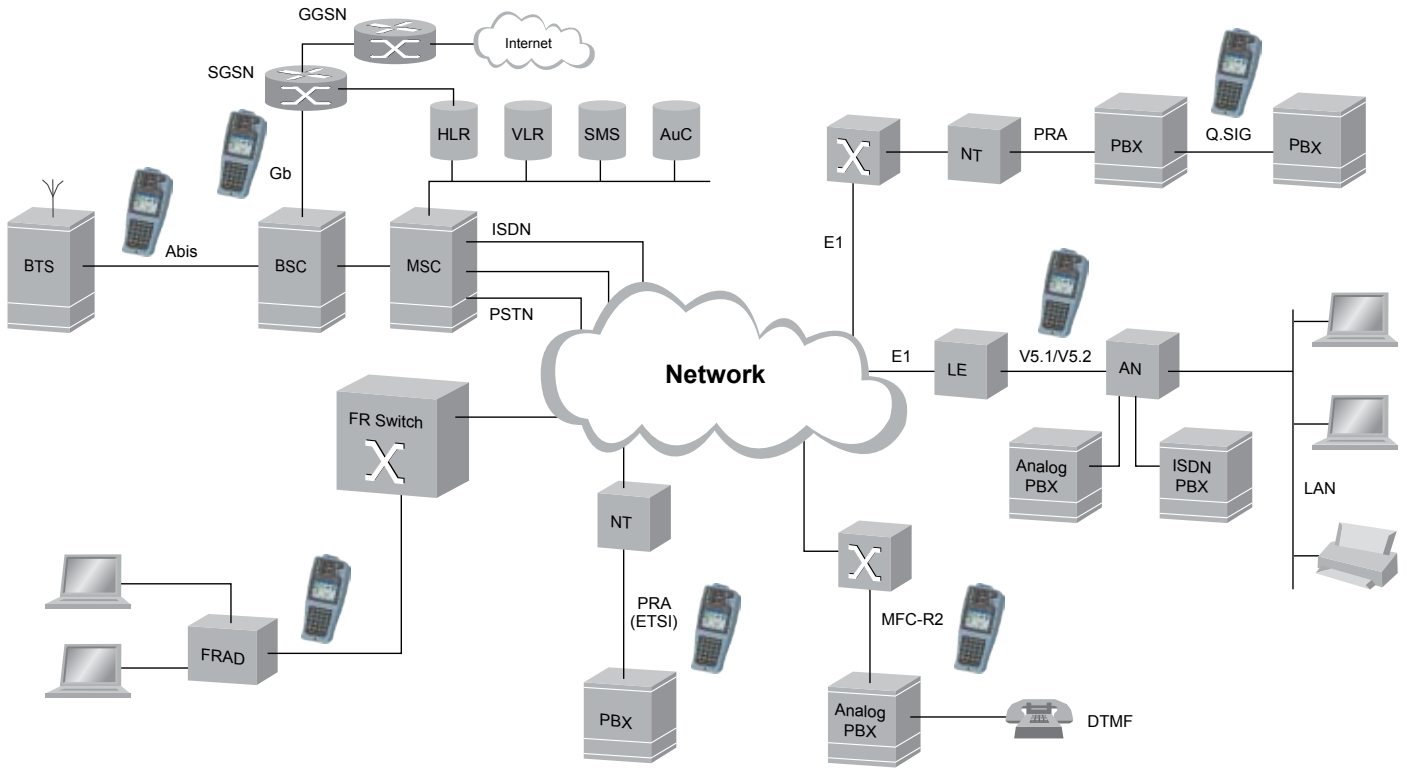
- Call emulation (speech/data)
- Detailed protocol analysis (ETSI, AUSSI, DASS2, DPNSS, Q.SIG)
- Auto supplementary service test
- Sequential call

V5.x

- Support V5.1 and V5.2
- Protocol analysis on all 3 timeslots simultaneously
- Statistic analysis (bidirectional)

MFC-R2, DTMF, SS5, Pulse

- Call analysis (bidirectional)
- Call emulation (ITU, user defined)



SUNRISE TELECOM®

GigE Module

MTT-50

Data Sheet

Dual port 10/100/1000BASE-T and 1000BASE-X

Now with VoIP, packet Delay Variation and 100FX support.

The MTT-50 GigE Module is the perfect choice for service providers who are currently using Sunrise Telecom's Modular Test Toolkit (MTT) in the field. The MTT-50 ensures rapid and efficient installation and maintenance of business Ethernet and IP services and significantly reduces repair time while maintaining the quality of service that customers demand. A complete set of testing capabilities makes the MTT-50 ideal for the field technician who needs to verify end to end transport of Ethernet/IP traffic, perform BER tests, determine throughput, link utilization and verify Voice over IP services. An intuitive user interface enables technicians with limited Ethernet or IP experience to verify performance parameters. The modular design and the wide range of test functionalities provides all of the tools needed for verifying Service Level Agreements while lowering the operating costs associated with the need for multiple test sets.

KEY FEATURES

- Full 10/100/1000 Mbps and Gigabit Ethernet line rate traffic generation
- 100M optical interface (100FX) available through SFPs
- Performs throughput, latency, frame loss, and back-to-back tests per RFC 2544 using Loopback or point-to-point without Loopback
- BER testing at Layer 1, Layer 2, and Layer 3 (IP) for Gigabit Ethernet and IP services
- Packet Delay Variation measurement per RFC3393 on BERT/RFC2544 modes
- IP verification with Ping, Trace Route, ARP Scan and IP Throughput across a routed network
- Generate up to 8 traffic flows with different MAC address, VLAN tag, and IP address configurations
- Class of Service (CoS) via VLAN P-bit and IP Type of Service (ToS/DSCP) traffic prioritization settings
- Optional Voice over IP testing: IP phone emulation, statistics and Voice Quality Measurements.
- Dual Port capability for network element prequalification testing
- Control/Respond Loopback feature to loop-up/down a far end MTT, STT or SunLite Ethernet modules
- Test Profiles for fast and efficient test set configuration and operation

BENEFITS

- The flexible modular design leverages the existing MTT platform and eliminates the need for multiple instruments
- The MTT chassis are rugged, light weight and field tested, with over 47,000 units in the field
- The MTT chassis' long battery life can be extended with the new 2X battery
- Remote, real time troubleshooting and analysis
- Completely interoperable with MTT, STT and SunLite Ethernet modules

APPLICATIONS

- Enables service providers and operators to turn-up and troubleshoot Ethernet and IP services
- Allows service providers to verify SLAs between themselves and their customers
- Automated SLA verification with RFC 2544 testing
- Layer 2 CoS settings for verifying Metro Ethernet services
- Test profile storing and loading for fast deployment of Ethernet services

SPECIFICATIONS

Connectivity

Ethernet (10BASE-T), Fast Ethernet
(100BASE-T and 100FX (**SWMTT50-100X**))
Gigabit Ethernet 1000BASE-T (**SWMTT50-1000T**)
(per IEEE 802.3, 2000 Edition)
Gigabit Ethernet 1000BASE-X (**SWMTT50-1000X**)
(per IEEE 802.3, 2000 Edition)
Connector type:
Dual Duplex LC for 100FX and 1000BASE-X
Dual RJ-45 UTP (10/100/1000BASE-T)
Optical transceiver type: SFP field interchangeable
SA580-850 (1000BASE-SX)
Transmitter
– Wavelength: 850 nm multi-mode
– Power: -9.5 dBm to -4 dBm
Receiver
– Wavelength: 770 nm to 860 nm
– Signal: -21 dBm to 0 dBm max
Optical Power Measurement (OPM) function available
SA580-1310 (1000BASE-LX)
Transmitter
– Wavelength: 1310 nm single-mode
– Power: -9.5 dBm to -4 dBm
Receiver
– Wavelength: 1270 nm to 1600 nm
– Signal: -25.5 dBm to -3 dBm max
Optical Power Measurement (OPM) function available
SA580-1550 (1000BASE-ZX)
Transmitter
– Wavelength: 1550 nm single-mode
– Power: +3 dBm to -2 dBm
Receiver
– Wavelength: 1270 nm to 1570 nm
– Signal: -24 dBm to -3 dBm max
Optical Power Measurement (OPM) function not available
SSMTT-28-FXM (100FX)
Transmitter
- Wavelength: 850 nm multi-mode
- Power: -3 to -9.5 dBm
Receiver
- Wavelength: 830 nm to 860 nm
- Signal : -17 dBm to 0 dBm max
SSMTT-28-FXS (100FX)
Transmitter
- Wavelength: 1310 nm single-mode
- Power: -8 to -15 dBm
Receiver
- Wavelength: 1260 nm to 1600 nm
- Signal : -28 dBm to -8 dBm max

Operation Mode

Dual port-to-point mode
Monitor mode
Management and point-to-point mode
Auto-negotiation enabled or disabled
Auto-negotiation parameters: pause flow control, asymmetric pause

BER/Throughput Testing

End-to-end testing with two test sets
Single-ended testing with loop on the other end
Singe test set bench testing
Dual port operation of tests mentioned above

Traffic Generation

Layer 1, Layer 2, or Layer 3 traffic
Configurable source and destination MAC address
Configurable 802.1q VLAN tag and 802.1p priority
Configurable MPLS tags (**SWMTT50-L3**)
Configurable source and destination IP address
(IPv4) (**SWMTT50-L3**)
Configurable IP header fields (ToS, TTL, Protocol, and Fragment Offset) for QoS verification testing (**SWMTT50-L3**)
Up to 8 independent traffic flows (MAC address, IP address, VLAN tag) (**SWMTT50-MULTI**)
Test patterns: All 1s, All 0s, ITU-T PRBS (2e31, compatible 2e23, compatible 2e31, normal or invert, or user defined (2 bytes)
Frame length 48 to 1518 bytes or Jumbo frame (up to 11000 bytes)
Frame rate 0% to 100% bandwidth utilization with steps of 0.1%
Traffic shaping: Constant, Ramp, or Burst
Error/Alarm injection: Bit, CRC, IP Checksum error and rate injection
Test duration

Measurements

Performance statistics: Transmitted and received bandwidth utilization (Min, Max, Average), frame rate (Min, Max, Average), transmitted and received line rate and data rate (kbps)
Frame statistics: Total number of transmitted & received frames, total number of received VLAN tagged, MPLS, TCP/UDP, frames, number of lost, out of sequence frames, oversized, multicast, flow control, broadcast and unicast frames, inter-frame delay measurement (Min, Max, Avg, Variation), frame size distribution, Packet Delay Variation (Min, Max, Avg)
Link statistics: Bit, CRC, IP checksum distribution count and rate, loss of signal, loss of synchronization, and out of service seconds counters
Events recorder with timestamp

Loopback Mode

Automatically loops all incoming frames with or without swapping the source and destination MAC address fields and IP address source and destination fields
Manual or controller/responder mode

IP Features (SWMTT50-L3)

PING Test

Step by step results showing connectivity to the router
Summary and detailed result screens
Statistics on PING messages
  Number of sent/received/missing/unreached messages
  Current/average/max/min round trip delay
Following parameters can be configured:
  IP mode (Static/DHCP mode)
  VLAN settings
  Local IP address
  Destination IP address
  Gateway address
  Number and rate of PING messages
  Frame length

Trace Route

Trace the IP route over the IP network up to 30 hops
Gateway, Router IP address traceability

ARP scan

Discover the MAC address of devices on the network by sending ARP requests to a range of IP addresses

VLAN scan

Discover the VLAN IDs that are configured on an interface

RFC 2544

Throughput, latency, frame loss rate, and back-to-back frames tests conform to RFC 2544 standard using Loopback or point-to-point without Loopback. PDV measurement per RFC3393
User configurable frame sizes (64 - 11000 bytes)
Configurable PASS/FAIL threshold
Tests can be run individually or in sequence
Available for Layer 2, and Layer 3 testing, including Ethernet routed circuits
Configurable IP header fields (ToS, TTL, Protocol, and Frame Offset) for QoS verification testing
RFC2544 test report in CSV format

Monitoring and Analysis

In-service monitoring with or without splitter
Measurements
  Signal and Frame Synchronization
  Bandwidth Utilization
  Rx Frames Count
  CRC Error
Events recorder with timestamp

Voice over IP SW Suite Features

Protocols:
  SIP (SWMTT50-SIP)
  H.323 (SWMTT50-H323)
CODEC:
  G.711µ
  G.711a
  G.723.1 – 5.3k, 6.3k
  G.726 – 16k, 24k, 32k, 40k
  G.729a
  G.729ab
IP Phone Emulation
  Place and Receive Calls
  Transmission of Pre-Installed Audio Files for Voice
Traffic Simulation
  Call Events and Messages
Call Statistics
  RTP Packet Count, Lost, Dropped
  Packet Jitter
Voice Quality Measurements
  Mean Opinion Score (MOS):
  Listening and Conversational Quality
  R-Factor: Listening and Conversational Quality, GAP, and BURST

Other Features

Multiple User Profiles

Up to 10 different test configuration profiles may be saved
Test profiles saved and loaded with the press of a button
Profiles can be shared across multiple chassis for fast and efficient test set configuration and operation

Results and Reports

Test results are saved in .CSV format for easy retrieval, sharing, and analysis of data. PDF reports are created on PC by importing CSV files.

Physical Layer

Cable test

Measure the length of copper Ethernet cable pair (meters or feet)

Optical power measurement

Report Tx/Rx Power, wavelength of the optical ports

PRODUCT DESCRIPTION

Module Size:
  5.0 W × 3.5 L × 0.9 H in (12.6 × 9 × 2.2 cm)
Operating Temperature:
  32˚ to 113˚F (0˚ to 45˚C)
Storage Temperature:
  -4˚ to 158˚F (-20˚ to 70˚C)
Humidity:
  5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-50 . . . . . GigE Module
Basic Package includes dual 10/100Base-T ports, Single Streams Layer 1/Layer 2 Ethernet Testing and 1-Year Standard Warranty in Hardware and Software. RJ-45 Interface Upgradable to10/100/1000 Base-T; Optical Interface Upgradable to 1000Base-X; SFP Modules Sold Separately.

Rebate Program

MTT-28 and MTT-29 modules are eligible for a rebate program. Refer to the online rebate form for details

Software Options

SWMTT50-1000T . . . Dual Port 1000Base-T
(enable 1000Base-T on RJ-45 interfaces)

SWMTT50-1000X. . . Dual Port 1000Base-X
(enable 1000Base-X on optical interfaces)

SWMTT50-L3 . . . . . Layer 3, MPLS and Advanced IP Features

SWMTT50-MULTI. . . Multiple Streams

SWMTT50-100X. . . . Dual Port 100 Base-FX/LX

SWMTT50-SIP. . . . . VoIP Analysis - SIP and MOS

SWMTT50-H323. . . . VoIP Analysis - H323 and MOS

Accessories

SA148 . . . . . SFP Optics Container

SA265 . . . . . Cable, 100Ω, CAT5e, RJ45 (M) to RJ45 (M), Cross-over, 6 ft.

SA266 . . . . . Cable, 100Ω, CAT5e, RJ45 (M) to RJ45(M), 6 ft.

SA508 . . . . . Optical Patch Cord, SMF, LCUPC to SCUPC, 6 ft.

SA558 . . . . . Optical Patch Cord, LCUPC to LCUPC, Duplex, SMF, 6 ft.

SA561 . . . . . Optical Patch Cord, LC-SC duplex, MMF, 62.5/125 um, 6 ft.

SA562 . . . . . Optical Patch Cord, SMF, LC-SC duplex, 6 ft.

SA580-850 . . . . . 850 nm LC SFP Field Interchangeable Optical Transceiver

SA580-1310. . . . . 1310 nm LC SFP Field Interchangeable Optical Transceiver

SA580-1550. . . . . 1550 nm LC SFP Field Interchangeable Optical Transceiver

SSMTT-28-FXM . . . . 850nm MMF LC Field Interchangeable Optical Transceiver

SSMTT-28-FXS . . . . . 1310nm SMF LC Field Interchangeable Optical Transceiver

Note: The MTT GigE Module is supported on most MTT platform host chassis including the MTT-ACM series and MTT-C. It is not supported on XDLS Full, MTT-EX and MTT-B chassis.

SUNRISE TELECOM®

For more information or a directory of sales offices: **info@sunrisetelecom.com** | **www.sunrisetelecom.com**
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SUNRISE TELECOM®

SDH/SONET Module

MTT-38

Data Sheet

The SDH/SONET Module is part of a family of plug-in modules for the SunSet MTT® and xDSL test sets

The MTT-38 SDH/SONET Module, part of the Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution for testing legacy SDH, SONET, PDH, and T-Carrier circuits from 2.5 Gbps to 2 Mbps/1.5 Mbps. Both in-service and out-of-service configurations cover installation, maintenance, and troubleshooting applications.

Auto-configuration takes the guesswork out of configuring the instrument to the circuit under test. Experienced users will appreciate advanced features like overhead monitoring and control, APS timing measurement, and pointer test sequences. All measurements conform to industry standards, and circuit impairments are displayed in a variety of ways, giving operators insight into the possible causes of circuit impairments.

KEY FEATURES

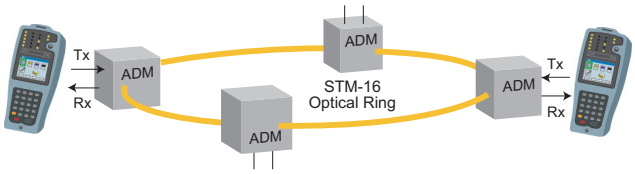
- Bit error ratio testing and performance analysis
- Pointer monitoring and test sequence generation
- Auto-configuration
- APS timing measurement
- Histogram and event log for errors and alarms
- Comprehensive payload mapping selection from VC4-16c/OC-48c (contiguous concatenation) to VC12/VT2, VC11/VT1.5, including PDH/T-Carrier payloads (1.5M, 2M, 34M, and 45M/DS1, E1, DS3, and T3)

BENEFITS

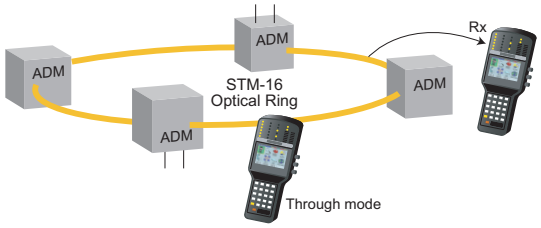
- SDH/SONET feature-rich
- Lightweight
- Flexible modular design
- Eliminates the need for multiple instruments
- Leverages existing MTT platform
- Intuitive and easy-to-use
- Cost-effective and future-proof

APPLICATIONS

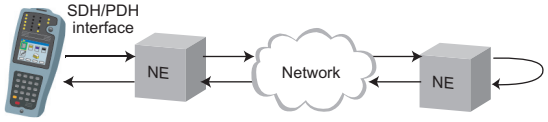
- Installation, maintenance, and troubleshooting
- Out-of-service testing



- In-service monitoring through protected monitoring points or optical splitters



- Round trip delay



SPECIFICATIONS

SDH/SONET

Operation Modes

Point-to-point
Payload through (2.5G and below)
Line through

SDH Optical (ITU-T G.707)

Connector: SFP, duplex LC
Rates: STM-16 (2.5 Gbps), STM-4 (622 Mbps), STM-1 (155 Mbps), STM-0 (52 Mbps)
Payloads: From 1.5/2M to VC4-16c
ITU-T mapping
Error injection
Alarm generation
Results measurements
Errors/Alarms
Performance: G.821, G.826, G.828, G.829, M.2101/2110
SDH pointer: Justification, increase, decrease

SONET Optical (Telcordia GR-253-CORE)

Connector: SFP, duplex LC
Rates: OC-48 (2.5 Gbps), OC-12 (622 Mbps), OC-3 (155 Mbps), OC-1/STS-1 (52 Mbps)
Payloads: From DS1/VT1.5 to STS-48c SPE
Error injection
Alarm generation
Results measurements
GR-253 bit performance
SONET defects
SONET pointer: Justification, increase, decrease

Test Patterns

PRBS, Fixed and User Programmable

Measurements Common to SDH/SONET

Optical power level measurement
Signal level measurement
Event log with timestamp
Frequency
Automatic tributary scan
Service Disruption measurement

SDH/SONET Overhead Features

ASCII decode of 16-byte or 64-byte HP/STS or LP/VT path trace bytes (J1/J2)
Programming K1/K2 APS signaling bytes
J0 Section trace generation
J1/J2 Path trace generation
S1 synchronization status messages decode and generation
Path overhead monitor
Programming of path overhead bytes
Pointer monitor: H1, H2, V1, V2 bytes
Pointer adjustment
Pointer test control
Pointer Test Sequences
Automatic Protection Switch Time Measurement
Tandem Connection Monitoring (HP/LP)

SFP Optical Transceivers

Lambda (nm)	Output Power (dBm)	Distance (km)	Rx Wavelength (nm)	Input Sensitivity (dBm)
STM-16/4/1/0, OC-48/12/3/1				
1310 SR	-10 to -3	< 2	1266 to 1580	-18 to -3
1310 IR	-5 to 0	< 15	1260 to 1580	-18 to 0
1310 LR	-2 to +3	< 40	1280 to 1335	-27 to 9
1550 IR	-5 to 0	< 40	1430 to 1580	-18 to 0
1550 LR	-2 to +3	< 80	1500 to 1580	-18 to 9
Data rates supported: 2488, 022, 155, 52 Mbps SONET and SDH				
STM-4/1/0, OC-12/3/1				
1310 IR	-15 to -8	< 15	1261 to 1360	-28 to -8
1310 LR	-3 to +2	< 40	1280 to 1335	-28 to -8
1550 LR	-3 to +2	< 80	1480 to 1580	-28 to -8
Data rates supported: 022, 155, 52 Mbps SONET and SDH				

Clock source: Internal, Loop, External

155 Mbps Electrical (STM-1) SSMTT-38-155ME

Connector: 75 ohm unbalanced SMG
External clock: Bantam

Transmitter

Clock source: Internal, Loop, External

Receiver

Frequency recovery range: 155.520 Mbps ± 50 ppm

52 Mbps (STS-1)

Connector: BNC

Transmitter

Clock source: Internal, Loop

Receiver

Frequency recovery range: 51.840 Mbps ± 50 ppm

PDH/T-carrier specifications

45 Mbps (DS3, T-Carrier)

Connector: BNC

Transmitter

Clock source: Internal, Loop
Alarm generation

Receiver

Frequency recovery range: 44.736 Mbps ± 50 ppm

34 Mbps (E3, PDH)

Connector: BNC

Transmitter
Clock source: Internal, Loop
Error injection
Alarm generation
Receiver
Frequency recovery range: 34.368 Mbps ± 50 ppm

2 Mbps (E1, PDH)
Connector: RJ-45
External clock: Bantam

Transmitter
Clock source: Internal, External, Loop
Error injection
Alarm generation
Fractional E1
Through mode

Receiver
Frequency recovery range: 2.048 Mbps ± 50 ppm

1.544 Mbps (DS1, T-Carrier)
Connector: RJ-45
External clock: Bantam

Transmitter
Clock source: Internal, External, Loop
Error injection
Alarm generation
Fractional T1
Through mode

Receiver
Frequency recovery range: 1.544 Mbps ± 50 ppm

PDH/T-Carrier Measurements

DS1, E1, E3, DS3
Error Performance: G.821, G.826 and M.2100
Errors/Alarms
Frequency measurements

Other Features
Loopback and Span Control
CSU/NIU Emulation
Propagation Delay
DS1 HDSL Span Control
DS3 FEAC
DS1/E1 View Received Data
E1 View FAS words
E1 View MFAS words
E1 Send Frame words

ATM Testing
Interface: UNI and NNI per ITU-T I.361
Quality of Service
Traffic Supervision
ATM View Test Records
VCC Scan
Cell Capture & Decode
Traffic Generation
DSLAM Testing
ATM/IP PING Test

PRODUCT DESCRIPTION

Module size (WxLxH): 5.0 x 3.5 x 0.9 in (12.6 x 9 x 2.2 cm)
Operating temperature: 32˚ to 122˚F (0˚ to 50˚C)
Storage temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-38	SDH/SONET Module

SFP Transceiver Options

SSMTT-38-155ME	155M Electrical SFP with SMG connector, include a software option for 155ME testing. Requires SA326, Conversion Cable, BNC (m) 75Ω to SMG (m) 75Ω, 6'
SA582-1310-IR[2]	622M/155M/52M, 1310 nm intermediate Reach Tx/Rx SFP, LCUPC/SMF Connector
SA582-1550-LR[2]	622M/155M/52M, 1550 nm Long Reach Tx/Rx SFP, LCUPC/SMF Connector
SA581-1310-SR[3]	2.5G/622M/155M/52M, 1310 nm Short Reach Tx/Rx SFP, LCUPC/SMF Connector
SA581-1310-IR[3]	2.5G/622M/155M/52M, 1310 nm Intermediate Reach Tx/Rx SFP, LCUC/SMF Connector
SA581-1310-LR[3]	2.5G/622M/155M/52M, 1310 nm Long Reach Tx/Rx SFP, LCUPC/SMF Connector
SA581-1550-IR[3]	2.5G/622M/155M/52M, 1550 nm Intermediate Reach Tx/Rx SFP, LCUPC/SMF Connector
SA581-1550-LR[3]	2.5G/622M/155M/52M, 1550 nm Long Reach Tx/Rx SFP, LCUPC/SMF Connector

Recommended Accessories

SA562	Optical Patch Cord, SMF, LC-SC duplex, 6'
SA563	Optical Patch Cord, SMF, LC-FC duplex, 6'

Software Options

SWMTT38-155M[2]	155M/52M Testing
SWMTT38-622M[2]	622M/155M/52M Testing
SWMTT38-25G[3]	2.5G/622M/155M/52M Testing
SWMTT38-E1A	2M ATM Testing
SWMTT38-T1A	1.5M ATM Testing
SWMTT38-T3A	45M ATM Testing
SWMTT38-E3155MA	155M ATM Testing
SWMTT38-622MA	622M ATM Testing
SWMTT38-2.5GA	2.5G ATM Testing

Notes:
1. *The SDH/SONET Module is not supported on the SSMTT-B chassis.*
2. *SWMTT38-155M or SWMTT38-622M must be ordered when any SA582-XXXX-XX transceiver is ordered*
3. *SWMTT-38-2.5G must be ordered when any SA581-XXXX-XX transceiver is ordered*

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SUNRISE TELECOM®

SHDSL Module

SSMTT-14B

Data Sheet

The SHDSL Module is part of a family of plug-In modules for the SunSet MTT® and xDSL test sets

The SSMTT-14B SHDSL Module, part of the SunSet Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution for the installation and verification of SHDSL networks. It provides a complete set of testing capabilities including network connectivity verification, 2-wire and 4-wire testing in both STU-C and STU-R modes for installation and service verification. STU-C E1, STU-R E1, and E1 modes are also available for SHDSL/E1 applications.

KEY FEATURES

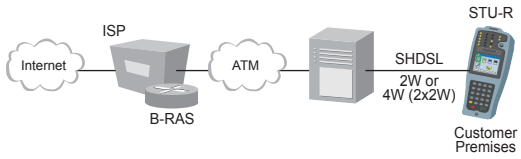
- SHDSL network installation and verification
- 2-wire and 4-wire testing in STU-C and STU-R modes
- Link turn-up with far end DSLAM
- Detailed modem/link status
- E1 testing option (STU-C E1, STU-R E1, and E1 modes)
- Advanced features option including ATM Features (VCC Scan, OAM Cell Generation, OAM Cell Statistics), and IP Features (Status, Advanced PING Test, Trace Route, and Echo Response)

BENEFITS

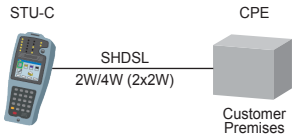
- Lightweight
- Handheld
- Portable design for easy side-to-side transport
- Leverages existing MTT platform
- Eliminates the need for multiple instruments
- One-button configuration and measurement simplifies and shortens testing time

APPLICATIONS

STU-R Mode



STU-C Mode



STU-R E1/STU-C E1 Mode

SPECIFICATIONS

Chipset
Conexant Orion

Connectors
SHDSL Line Interface (STU): RJ-45 @ 135Ω
E1 Line Interface (PAYLOAD): RJ-45 @ 120Ω

SHDSL
Test Modes
- STU-C, STU-R (SSMTT-14B)
- STU-C E1, STU-R E1, E1 (SWMTT-14B-E1)

Test Rates
- SHDSL 2-wire: AUTO from 128 kbps to 2312 kbps (SSMTT-14B)
- SHDSL 4-wire: AUTO from 256 kbps to 4624 kbps (SWMTT-14B-4W)

Modem Status Measurements
- Line Rate and Payload Rate
- Current SNR Margin
- Attenuation
- Maximum and minimum SNR Margin
- CRC, ES, SES, UAS
- Loss of Sync Word Second

SHDSL System Loopbacks
Complies with ITU-T G.991.2

Operation Modes

STU-R Mode
- One button link turn up test with DSLAM STU-C
- Service Verification to ISP with PING Testing

STU-C Mode
- Link turn-up with STU-R
- Loop Prequalification

STU-R E1 Mode (SWMTT-14B-E1)
- Link turn-up test with DSLAM STU-C E1
- Configure and perform E1 Bit Error Rate Testing

STU-C E1 Mode (SWMTT-14B-E1)
- Link turn-up test with CPE STU-R E1
- Configure and perform E1 Bit Error Rate Testing

E1 Mode (SWMTT-14B-E1)
- E1 Transmit and Receive
- Configure and perform E1 Bit Error Rate Testing

Basic IP Features
Protocol Standards Supported
- RFC 1483/2684: LLC-Bridged (Static and DHCP), LLC-Routed
- RFC 2364: PPP over ATM
- RFC 2516: PPP over Ethernet
- RFC 2225: Classical IP over ATM
- Encapsulation: VC MUX/LLC SNAP

Basic PING Test
- PASS/FAIL results for: Connectivity to the router, PPP session, PING test
- Store 10 complete PING profiles

ATM Features (SWMTT-14B-ATM)
VCC Scan
- Scan up to 4 VCCs
- Display VPI, VCI, PTI, CLP

ATM OAM Test
- Automatic cell response and statistics to the far end OAM requests

ATM OAM Cell Generation
- Transmit F4/F5 End-to-End, Segment, AIS, or RDI commands
- Statistics: Current/Average/Max/Min roundtrip delay

Advanced IP Features (SWMTT-14B-IP)
Statistics: PING to URL or IP address
Number of Messages Sent, Received, Unreached, and Missing
Roundtrip Delay for Current, Average, Maximum, and Minimum
Trace Route
Automatic PING Echo Response and Record
PPP/DHCP Session Analysis
- IP Addresses for Local, Gateway, and Subnet Mask

E1 (SWMTT-14B-E1)
Line Interface: RJ-45
- Term, Monitor: 120Ω balanced
- Bridge: High impedance

Framing: Unframed, PCM-30, PCM-31, with or without CRC-4, conforms to ITU-T G.704
Transmit Clock: Internal, Rx
Measurements: Summary, G.821, Alarms, and G.826
Test Patterns: 2e23, 2e20, 2e15, 20ITU, 2047, 511, 127, 63, 1111, 1010, 0000, FOX, QRS, 1-4, 1-8, 3-24

PRODUCT DESCRIPTION

Module Size (W×L×H): 5.0 × 3.5 × 0.9 in (12.6 × 9 × 2.2 cm)
Operating Temperature: 32˚ to 122˚F (0˚ to 50˚C)
Storage Temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-14B	Conexant SHDSL STU-R/C Module; Includes 2-wire and Basic PING Testing, and SA272 cable
SWMTT-14B-4W	Conexant SHDSL STU-C/R option, 4-wire SHDSL Testing
SWMTT-14B-E1	E1 Testing option
SWMTT-14B-ATM	Includes VCC Scan, OAM Cell Generation, OAM Cell Statistics
SWMTT-14B-IP	Includes Configuration IP Status, Ping Test, Trace Route, Echo Response

Replacement Cables

SA271	Cable, RJ-45 (m) 8-pin to 4 Probe Clip, 6'
SA272	Cable, RJ-45 to two RJ-11, 6'

For more information or a directory of sales offices: **info@sunrisetelecom.com** | **www.sunrisetelecom.com**

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SUNRISE TELECOM®

UDSL-3Play Module

MTT-48

Data Sheet

The UDSL-3Play Module for the MTT Platform

The UDSL-3Play Module for the MTT Platform addresses key test requirements for Triple Play services deployed over a 'Universal' DSL access network. Features include VDSL2 and ADSLx infrastructure tests and services testing for Data, Video, and VoIP, enabling network service providers to verify and ensure these new IP based services are properly delivered to end users. Another benefit is the support of Triple Play Services features at both the DSL and 10/100 Ethernet test interfaces, enabling technicians to sectionalize problems at the Customer Premises.

KEY FEATURES

- CPE Emulation for VDSL2, ADSL2+, ADSL2, and ADSL1.
- One Button Test providing key DSL layer metrics including Data Rate, SNR Margin and line errors.
- Triple Play Services testing for IP Data, IP Video, and VoIP for both 10/100 Ethernet and DSL test interfaces.
- CO Emulation capability for CPE verification and pre-qualification tests.

BENEFITS

- Provides Universal DSL infrastructure test capability, all-in-one.
- Eliminates the need for multiple VDSL/ADSL/IP services test equipment.
- Simple, intuitive user interface.
- Leverages the MTT Platform, the industry leader for handheld field test solutions.
- The combination of an MTT ACM II Host Chassis with the UDSL-3Play Module is the ultimate all-in-one test tool for DSL based Triple Play services, enabling thorough verification of the copper infrastructure and the Triple Play IP services that are delivered over the DSL pipe.

SPECIFICATIONS

DSL Standards

ITU-T G.993.2 VDSL2
  Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a
ITU-T G.992.5 ADSL2+ Annex A, B, L, M
ITU-T G.992.3 ADSL2 Annex A, B, L, M
ITU-T G.992.1 ADSL1 Annex A, B
ANSI T1.413 ADSL1
G.992.5 Amendment 3 INP support
Modes: XTU-R CPE and XTU-O CO
Note: VDSLx mode, ADSLx mode and CO mode are orderable options.

DSL Features

Actual Data Rate
Maximum Attainable Rate
SNR Margin
Capacity
Attenuation
Latency Path
INP
Interleaved Delay and Depth
Transmit (Output) Power
CRC, FEC, HEC, SEF counters
Number of Retrains
Bits per Tone
SNR per Tone
Event Tracer

SPECIFICATIONS (CONTINUED)

IP Data SW Suite Features (*optional*)

DSL and 10/100 Ethernet Interface Terminate Mode
IP Data Pass Through Mode: DSL to LAN
PING Statistics
- Sent, Received, Loss Rate, Round Trip Delay

Trace Route
Web Access Test
- FTP Upload and Download
- HTTP Download

Protocols
- RFC 2684 Bridged, Static and DHCP
- RFC 2516 PPP over Ethernet with PAP/CHAP authentication
- RFC 2364 PPP over ATM with PAP/CHAP authentication
- RFC 2225 Classical IP over ATM
- Encapsulation: LLC or VC Mux
- Packet Transfer Mode (PTM) for IP DSLAMs

IP Video SW Suite Features (*optional*)

DSL and 10/100 Ethernet Interface Terminate Mode
Transport Stream
- MPEG2-TS UDP/RTP

Encoders
- MPEG2, MPEG4 Part 2, MPEG4 Part 10 / H.264, VC-1

STB Emulation
- IGMP Multicast Client V2 and V3
- STB Registration via DHCP Options 60, 61, 43, and 77
- Supports up to four video streams

Transport Stream Measurements
- Packet Count: Received, Expected, Lost, Loss Rate
- Packet Jitter
- IGMP Latency
- Inter Packet Gap
- TS Rates: Total, Video, and Audio

PID Analysis
- PID Number, Type, and Description

Channel Test
- Channel Change Delay – IGMP Latency (Zap Time)
- Channel Bandwidth

Media Delivery Index (MDI per RFC 4445)
- Delay Factor
- Media Loss Rate
- *MDI is licensed from IneoQuest™*

Video On Demand (VOD) Analysis
- RTSP Unicast Client
- Describe and Play Media
- Packets: Received, Dropped, Jitter

Voice Over IP SW Suite Features (*optional*)

DSL and 10/100 Ethernet Interface Terminate Mode
Protocols:
- SIP
- H.323

CODEC:
- G.711µ
- G.711a
- G.723.1 – 5.3k, 6.3k
- G.726 – 16k, 24k, 32k, 40k
- G.729a
- G.729ab

IP Phone Emulation
- Place and Receive Calls
- Transmission of Pre-Installed Audio Files for Voice Traffic Simulation

Call Events and Messages
Call Statistics
- RTP Packet Count, Lost, Dropped
- Packet Jitter

Voice Quality Measurements
- Mean Opinion Score (MOS): Listening and Conversational Quality
- R-Factor: Listening and Conversational Quality, GAP, and BURST

Product Description

Module Size (W × L × H): 12.6 × 9.0 × 2.2 cm (5.0 × 3.5 × 0.9 in)
DSL Interface: RJ-45 @ 100Ω
Ethernet Interface: RJ-45 10/100 Base-T

ORDERING INFORMATION

Base Module

SSMTT48-ADSLX . . . UDSL-3Play Module with ADSLx Mode
SSMTT48-VDSLX . . . UDSL-3Play Module with VDSLx Mode

Software Options

SWMTT48-ADSLX . . ADSLx mode for SSMTT48-VDSLX Base Module

SWMTT48-VDSLX . . VDSLx mode for SSMTT48-ADSLX Base Module

SWMTT48-DATA . . . IP Data SW Suite
Includes PING Test with statistics, Trace Route, and FTP/HTTP Web Access Test for both DSL and 10/100 test ports.

SWMTT48-VIDEO. . . IP Video SW Suite
Includes IP Video Transport Stream measurements, PID Analysis, Channel Test, MDI Measurements and VOD Tests for both DSL and 10/100 test ports.

SWMTT48-VoIP . . . . VoIP SW Suite
Includes SIP and H.323 protocols with Call Features, RTP packet statistics and Voice Quality measurements for both DSL and 10/100 test ports.

SWMTT48-CO . . . . . CO Mode

Note: The UDSL-3Play Module is supported on most MTT Platform host chassis including the MTT-ACM series, MTT-C, and MTT-B. It is not supported on XDSL Full and MTT-EX host chassis.

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